NOTES AND NEWS ITEMS

The *Experiment Station Record* for June has this to say editorially of recent work with the respiration calorimeter. "Of late a new line of experiments has been undertaken with the respiration calorimeter, which marks a departure in studies of this kind and indicates a broader application of the apparatus. These new studies relate to the ripening of fruit, and are being carried on in coöperation with the Bureau of Chemistry. They have shown that the apparatus is suited to studies of the changes going on during ripening, and that as a living body the functions of the plant as well as of animals may be observed."

"A number of bunches of green bananas were placed in the respiration chamber and kept under observation until the ripening process was completed to the usual commercial stage, which requires three or four days. During this time the oxygen consumption, the carbon dioxid excretion, and the heat elimination were determined in a manner not previously possible, throwing interesting light on the chemical process of ripening."

"These experiments have been repeated sufficiently to check the results and suggest the nature of the changes. Important data have already been obtained regarding the respiratory quotient, the carbon dioxid thermal equivalent, and the amount of energy liberated by the bananas during the ripening process. The indications are that physical and chemical factors which are of the greatest value in the study of this problem, important from a practical as well as a theoretical standpoint, can be accurately measured with the respiration calorimeter. The results will assist in the interpretation of analytical studies and throw a new light on the problems involved in the ripening and storage of fruit. As the method is applicable, not only to fruit of all kinds, but to vegetables and other products, it is believed to have a wide range of possibilities."

"It has been suggested furthermore that some of the changes taking place during the germination of seeds, a subject which has been studied in other ways, could be more accurately determined. The heating of grain in storage is also a problem to the study of

which the apparatus lends itself. With certain adaptations, which are believed mechanically possible, the apparatus might be used in connection with growing plants to study their transpiration, respiration, etc., as well as the energy required for these different physiological processes. But little is known regarding the energy changes of plant activity, and this apparatus seems to afford means of extending knowledge along that line. Indeed, the possibilities for the study of the respiratory exchange and energy production of vegetable products and plant life are well-nigh unlimited, and open up a line of investigation of great importance."

The seeds and plants imported by the Bureau of Plant Industry in the early part of 1910 make, with their descriptions, an eighty-page booklet which is supplied free of charge by the Department of Agriculture.

Volume one, number one, of the Journal of the Washington Academy of Sciences has just appeared. It is " . . . a medium for the publication of original papers and a record of scientific work in Washington [D. C.]. It accepts for publication (1) brief papers written or communicated by resident or non-resident members of the academy; (2) abstracts of current scientific literature published in or emanating from Washington; (3) proceedings and programs of the affiliated societies; and (4) notes of events connected with the scientific life of Washington." The journal is a semi-monthly, costs six dollars a year to non-members of the academy, and is not offered in exchange. Very little botanical is found in this first number, but there are abstracts of W. H. Kempfer's paper on the preservative treatment of poles, and of F. G. Plummer's Forest Service Bulletin No. 85 on "Chaparral: Studies in the dwarf forests, or elfin wood of Southern California."

Bulletin 87 of the Forest Service deals with the Eucalpyts in Florida. It contains nearly fifty pages of interesting reading, illustrations, and a table showing the various species, their uses, rate of growth, climatic and soil requirements, etc.

Some time ago the Alabama Polytechnic Institute issued a circular on school improvement. The joint authors, R. S. Machintosh and P. F. Williams, have given good general advice for the successful work and maps showing various treatments of plots of various sizes. The short descriptive list of trees, shrubs, vines, and herbs adds much to the value of the pamphlet and suggests that such a boooklet would be useful for every state and prevent the mistakes often made—not only in the planning of the grounds but in the yearly Arbor Day work. Too often schools have little or nothing to show for the energy spent in such exercises, or else a quantitative success with a tiresome sameness.

Investigating the assimilation of atmospheric nitrogen by fungi, L. H. Pennington (BULLETIN Torrey Botanical Club, March) worked with several common molds and secured results "in harmony with the generally accepted notion that fungi do not have the ability to assimilate atmospheric nitrogen." The definite reports to the contrary may be explained by experimental error; or probably by variation in the different strains of fungi. With this last explanation in view distinct strains are being isolated to test variations in this ability.

Protective enzymes have been studied in pomaceous and other fruits by several workers from the Delaware Agricultural Station (*Science*, April 10). The work was suggested by experiments on the toxicity of tannin, and the conclusions follow: (1) Normal living fruits contain two enzymes, a catylase and an oxidase. (2) Tannin, as such does not exist in any part of the normal uninjured fruit previous to maturity, except possibly a small amount in the peel. (3) The oxidase acts only in an acid solution; it helps form a tannin or tannin-like substance which can precipitate proteid matter and form a germicidal fluid. (4) These changes may be caused by injuries to normal immature fruits by fungi, insects and mechanical agencies.

Under "A Universal Law" Wilder D. Bancroft calls attention in the Journal of the American Chemical Society to the universal law known to biologists as the survival of the fittest and to

physicists, chemists, business men, etc., by various other names. A wide range of illustrations is given, taken almost entirely from the biological sciences and grouped under such topics as pressure and concentration, temperature, light, moisture, food and fertilizers, secretions, climate, and non-adaptability. The biologist's point of view is discussed, and spontaneous variation is described as "merely another way of expressing our ignorance" due to the fact the present and transmitted effects of external conditions are known but incompletely. The article was reprinted in *Science* and has been the cause of much commendatory discussion.

Professor Bessey has corrected the plant group estimates given in *Torreya*, adding (approximately) 1,300 to the ferns, 70 to the gymnosperms, 3,700 to the monocotyledons, and 18,000 to the dicotyledons. These, with a few other changes, make a total estimate of 233,000 instead of 210,000.

Frederick V. Coville (*Science*, May 5) suggests growing trailing arbutus in acid soils. Successful experiments were conducted with these plants—so rarely seen in cultivation—by using an acid soil, nine parts kalmia peat and one part clean sand. By March seeds from the previous July had produced plants unusual in size (seven-eighths of an inch in diameter) and fragrance. Mr. Coville incidentally describes the fruit of the arbutus as juicy instead of dry and states that the dehiscence is not loculicidal. At the lecture on June 3, at the New York Botanical Garden, Mr. Coville showed many interesting lantern photographs, and demonstrated more extensively on the cultivation of numerous plants of the heath family and of some of our local orchids in acid soils.

The following single sheet publication of the Department of Agriculture is attracting wide notice: "A NEW KIND OF CORN FROM CHINA." "A small lot of shelled corn, of a kind that is new to this country, was sent to the U. S. Department of Agriculture from Shanghai, China, in 1908, and tested the same season. It proved to have qualities that may make it valuable

in breeding a corn adapted to the hot and dry conditions of the Southwest. The plants raised in the test averaged less than 6 feet in height, with an average of 12 green leaves at the time of tasseling. The ears averaged $5\frac{1}{2}$ inches in length and $4\frac{1}{3}$ inches in greatest circumference, with 16 to 18 rows of small grains. On the upper part of the plant the leaves are all on one side of the stalk, instead of being arranged in two rows on opposite sides. Besides this, the upper leaves stand erect, instead of drooping, and the tips of the leaves are therefore above the top of the tassel. The silks of the ear are produced at the point where the leaf blade is joined to the leaf sheath, and they appear before there is any sign of an ear except a slight swelling.

"This corn is very different from any that is now produced in America. Its peculiar value is that the erect arrangement of the leaves on one side of the stalk and the appearance of the silks in the angle where the leaf blade joins the sheath offer a protected place in which pollen can settle and fertilize the silks before the latter are ever exposed to the air. This is an excellent arrangement for preventing the drying out of the silks before pollination. While this corn may be of little value itself, it is likely that, by cross-breeding, these desirable qualities can be imparted to a larger corn, which will thus be better adapted to the Southwest.

"The discovery of this peculiar corn in China suggests anew the idea that, although America is the original home of corn, yet it may by some means have been taken to the Eastern Hemisphere long before the discovery of America by Columbus. From descriptions in Chinese literature corn is known to have been established in China within less than a century after the voyage of Columbus. But this seems a short time for any plant to have become widely known and used. Besides, this particular corn is so different from anything in the New World that it must have been developed in the Old World, and for that to happen in a natural way would take a very long time. These ideas are brought out in Bulletin 161 of the Bureau of Plant Industry, which gives also an account of some cross-breeding experiments with the new corn and the changes which crossing produces in the grains the same season."